Editorial Note

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Finite Series of Computer-Implementable Instructions

ASM Muntaheen*

Department of ICT-GIS Division, Institute of Water Modelling (IWM), Dhaka, Bangladesh

***Corresponding author:** ASM Muntaheen, Department of ICT-GIS Division, Institute of Water Modelling (IWM), Dhaka, Bangladesh, E-mail: muntaheen.mist@gmail.com

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Editorial Note

This journal is a finite sequence of well-defined, computer-implementable instructions is a finite sequence of well-defined, computer-implementable instructions, typically to solve a class of specific problems or to perform a computation, as defined in mathematics and computer science. Algorithms are always clear and are used to specify how calculations, data processing, automated reasoning, and other tasks should be done. A heuristic, on the other hand, is a problem-solving methodology that use practical approaches and/or varied estimates to develop solutions that may not be ideal but are adequate given the circumstances.

An algorithm is a method for calculating a function that can be represented in a finite amount of space and time and in a well-defined formal language. The instructions describe a computation that, when run, continues through a finite number of well-defined sequential stages, starting with an initial state and initial input (possibly empty). Eventually, "output" is produced, and the process ends in a final state. The shift from one state to the next isn't always predictable; some algorithms, known as randomized algorithms, take random input into account.

Algorithmic Analysis

It's often useful to know how much of a given resource (like time or storage) is theoretically required for a given algorithm. Methods for analysing algorithms to produce such quantitative responses (estimates) have been developed; for example, the sorting algorithm above has a time requirement of O (n), where n is the length of the list. As a result, if the space required for storing the input numbers is not counted, it is said to have a space demand of O (1), while if it is counted, it is said to have a space demand of O (n).Different algorithms may complete the same task with a different set of instructions in less or more time, space, or 'effort' than others. For example, a binary search algorithm (with cost O (log n)) outperforms a sequential search (cost O (n)) when used for table lookups on sorted lists or arrays.

Reduction of Complexity

This method entails converting a difficult problem into a more well-known problem for which we (hopefully) have asymptotically optimal algorithms. The goal is to find a reduction algorithm whose reduced algorithms do not have a high complexity. One selection technique for obtaining the median in an unsorted list, for example, requires sorting the list first.

Cryptographic Algorithms

Al-Kind, a 9th-century Arab mathematician, created the first cryptographic technique for deciphering encrypted code in A Manuscript on Deciphering Cryptographic Messages. He described cryptanalysis through frequency analysis, the first code breaking algorithm, for the first time.

Measuring and Improving the Euclid Algorithms

"When contrasted to "Inelegant," which has thirteen instructions, "Elegant" is the apparent winner. Inelegant, on the other hand, is quicker (it arrives at HALT in fewer steps). The reason for this is because "Elegant" does two conditional tests in each subtraction loop, whereas "Inelegant" just performs one. As the algorithm (usually) requires many loop-through, on average much time is wasted doing a "B = 0?" test that is needed only after the remainder is computed. Can the algorithms be improved?: Once a programmer has determined that a programme is "fit" and "effective," The reduction of five steps can increase the compactness of "Inelegant." But Chitin proved that compacting an algorithm cannot be automated by a generalized algorithm Observe. When compared to "Elegant," it's clear that these stages, along with stages 2 and 3, can be removed. The number of basic instructions is reduced from thirteen to eight, making it "more elegant" than "Elegant," which has nine steps.

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